



1 gcgccgcgc gaccgcgcgc ccagtcgcc cccgccccc ctaaccgccc cagacacag  
61 gctcgccgag gctcgcttgg accctgatct taccctggg caccctgcgc tctgcctgcc  
121 gcgaagaccg gctccccgac ccgcagaagt caggagagag ggtgaagcgg agcagcccca  
181 ggcggggcag cctccccgag cagcgcgcg cagagcccg gacaatgggg ccgcggcgcc  
241 tgctgctggt ggccgcctgc ttcagctgtt gggcccgct gttgtctgcc cgcacccggg  
301 ccgcagggc agaatacaaa gcaacaatg ccaccttaga tccccggtca tttcttctca  
361 ggaaccccaa tgataaatat gaaccatttt gggaggatga ggagaaaaat gaaagtgggt  
421 taactgaata cagattagtc tccatcaata aaagcagtc tctcaaaaa caacttcctg  
481 catcatctc agaagatgcc tccggatatt tgaccagctc ctggctgaca ctcttctcc  
541 catctgtgta caccggagtg tttgtagtca gcctccact aaacatcatg gccatcgttg  
601 tgttcatcct gaaaatgaag gtcaagaagc cggcggtggt gtacatgctg cacctggcca  
661 cggcagatgt gctgtttgtg tctgtgctcc cctttaatg cagctattac tttccggca  
721 gtgattggca gtttgggtct gaattgtgc gctcgtcac tgcagcattt tactgtaaca  
781 tgtacgcctc tatctgctc atgacagtca taagcattga ccgggttctg gctgtggtgt  
841 atcccatgca gtccctctcc tggcgtaact tgggaaggc ttccttcaact tgtctggcca  
901 tctggggctt ggccatcgca gggtagtgc ctctgctct caaggagcaa accatccagg  
961 tgcccgggct caacatcact acctgtcatg atgtgctcaa tgaaccctg ctgaaaggct  
1021 actatgccta ctacttctca gccttctctg ctgtcttctt ttttgtgccg ctgattcattt  
1081 ccacgggtctg ttatgtgtct atcattcgat gtcttagctc ttcgcagatt gccaaaccga  
1141 gcaagaagtc ccgggctttg ttcctgtcag ctgctgtttt ctgcatcttc atcatttgct  
1201 tcggacccac aaacgtcctc ctgattgcgc attactcatt ccttctcac acttccacca  
1261 cagaggctgc ctactttgcc tacctcctct gtgtctgtgt cagcagcata agctcgtgca  
1321 tcgacccccc aatttactat tacgcttct ctgagtggca gaggtacgtc tacagtatct

Fig. 1A

1381 tatgctgcaa agaaagtcc gatccagca gttataacag cagtgggcag ttgatggcaa  
1441 gtaaaatgga tacctgctct agtaacctga atacaaaaag ctgttaactt  
1501 aggaaaaagg actgctggga ggttaaaaag aaaagtgaat aacctgagga  
1561 ttctattagt cccacccaa actttattga ttcacctcct aaaacaacag atgtacgact  
1621 tgcataacctg ctttttatgg gagctgtcaa gcatgtattt ttgtcaatta ccagaaaagat  
1681 aacaggacga gatgacggtg ttattccaag ggaatatgc caatgctaca gtaataaatg  
1741 aatgtcactt ctggatatag ctaggtgaca tatacatact tacatgtgtg tataatgtaga  
1801 tgtatgcaca cacatatatt attgcagtg cagtatagaa taggcacttt aaacactct  
1861 ttccccgcac ccagcaatt atgaaaaataa tctctgattc cctgatttaa tatgcaaagt  
1921 ctaggttggt agagtttagc cctgaacatt tcatggtgtt catcaacagt gagagactcc  
1981 atagtttggg ctgtaccac ttttgcaaat aagtgtattt tgaattgtt tgacggcaag  
2041 gttaaagtta ttaagaggta agacttagta ctatctgtgc gtagaagttc tagtgttttc  
2101 aattttaaac atatccaagt ttgaattcct aaaattatgg aaacagatga aaagcctctg  
2161 ttttgatatg ggtagtattt tttacatttt acacactgta cacataagcc aaactgagc  
2221 ataagtcctc tagtgaatgt aggcctggctt tcagagtagg ctattcctga gagctgcatg  
2281 tgtccgcccc cgatggagga ctccaggcag cagacacatg ccaggggccat gtcagacaca  
2341 gattggccag aaaccttcct gctgagcctc acagcagtga gactggggcc actacatttg  
2401 ctccatcctc ctgggattgg ctgtgaactg atcatgttta tgagaaactg gcaaagcaga  
2461 atgtgatata ctaggaggta atgaccatga aagacttctc taccatctt aaaaaaacg  
2521 aaagaaggca tggacttctg gatgcccatc cactgggtgt aaacacatct agtagttgtt  
2581 ctgaaatgtc agttctgata tggaagcacc cattatgcgc tgtggccact ccaatagggtg  
2641 ctgagtgtac agagtggaaat aagacagaga cctgccctca agagcaaagt agatcatgca

Fig. 1B

2701 tagagtgtga tgtatgtgta ataatatgt ttacacaaa caaggcctgt cagctaaaga  
2761 agtttgaaca tttgggttac tatttcttgt gttataact taatgaaaac aatgcagtac  
2821 aggacatata ttttttaaaa taagtctgat ttaattgggc actatttatt tacaatgtt  
2881 ttgctcaata gattgctcaa atcaggtttt cttttaagaa tcaatcatgt cagtctgctt  
2941 agaaataaca gaagaaaata gaattgacat tgaaatctag gaaaattatt ctataatttc  
3001 catttactta agacttaatg agactttaaa agcatttttt aacctcctaa gtatcaagta  
3061 tagaaaatct tcatggaatt cacaagtaa tttggaaatt aggttgaaac atatctctta  
3121 tcttacgaaa aaatggtagc attttaaca aatagaaag ttgcaaggca aatgtttatt  
3181 taaaagagca ggccaggcgc ggtggctcac gcctgtaac ccagcacttt gggaggctga  
3241 ggcgggtgga tcacgaggtc aggagatcga gaccatcctg gctaacacgg tgaaacccgt  
3301 ctctactaaa aatgcaaaaa aaattagccg ggcgtggtgg caggcacctg tagtcccagc  
3361 tactcgggag gctgaggcag gagactggcg tgaacccagg aggcggacct tgtagtgagc  
3421 cgagatcgcg cactgtgct ccagcctggg caacagagca agactccatc tcaaaaaaa

**Fig. 1C**

MGPRRLLLVAACFSLCGPLLSARTRARRPESKATNATLD  
PRSFLLRNPNDKYEPFWEDEEEKNESGLTEYRLVSINKSS  
PLQKQLPAFISEDASGYLTSSWLTFLVPSVYTG VFVWSL  
PLNIMAIVVFILKMKVKKPAVVYMLHLATADVLFVSVLPFK  
ISYYFSGSDWQFGSEL CRFVTAAFYCNMYASILLMTVISI  
DRFLAVVYPMQSLSWRTLGRASFTCLAIWALAIAGVWPL  
VLKEQTIQVPGLNITTCHDVLNETLLEGYYAYYFSAFSAV  
FFVPLIISTVCYVSIIRCLSSSAVANRSKKSRAFLSAAV  
FCIFIICFGPTNVLLIAHYSFLSHTSTTEAAYFAYLLCVCVS  
SISSCIDPLIYYYASSECCQRYVYSILCCKESSDPSSYNSS  
GQLMASKMDTCSSNLNNSIYKKLLT

**Fig. 1D**

cctgcctgca cggcacagga gagcaactt ctacagacag accaaggctt ccatttgctg 60  
ctgacacatg gaactgaggt gaaattgtgc tccatgattt tacagatttc ataacgttta 120  
agagacggga ctcagggtcat caaatgaaa gccctcatct ttgcagctgc tggcctcctg 180  
cttctgttgc ccactttttg tcagagtggc atggaataatg atcaaaacaa cttggaacaa 240  
ccaaccttac ccattaagac ctttcgtgga gctcccccaa attcttttga agagtcccc 300  
tttctgcct tggaaggctg gacaggagcc acgattactg taaaaattaa gtgccctgaa 360  
gaaagtgcct cacatctcca tgtgaaaaat gctaccatgg ggtacctgac cagctcctta 420  
agtactaaac tgatacctgc catctacctc ctggtgtttg tagttggtgt cccggccaat 480  
gctgtgacct tgttgatgct tttctcagg accagatcca tctgtaccac tgtattctac 540  
accaacctgg ccattgcaga ttttcttttt tgtgttacat tgccctttaa gatagcttat 600  
catctcaatg ggaacaactg ggtatttggg gaggtcctgt gccggggccac cacagtcatc 660  
ttctatggca acatgtactg ctccattctg ctcccttgct gcatcagcat caaccgctac 720  
ctggccatcg tccatccttt cacctaaccg ggcctgcca agcacaccta tgccttggtg 780  
acatgtggac tgggtgtggc aacagttttc ttatatatgc tgccattttt catactgaag 840  
caggaatatt atcttgttca gccagacatc accacctgcc atgatgttca caacacttgc 900  
gagtcctcat ctcccctcca actctattac ttcattctct tggcattctt tggattctta 960

**Fig. 10A**

attccatttg tgcttatcat ctactgctat gcagccatca tccggacact taatgcatac 1020  
gatcatagat ggttggtgta tgtaaggcg agtctcctca tccttgatgat ttttaccatt 1080  
tgctttgctc caagcaatat tattcttatt attcaccatg ctaactacta ctacaacaac 1140  
actgatggct tatattttat atatctcata gcttgtgcc tgggtagtct taatagttgc 1200  
ttagatccat tcctttattt tctcatgtca aaaaccagaa atcactccac tgcttacctt 1260  
acaaaatagt gaaatgatct tagagaacaa ggacagccat cacagagaac gtctgttttc 1320  
aagaacaaca taagcatagt gcaaggagct ccatttcga gctcctaaga aatatgcttc 1380  
aaagggtcaa cattacaaa gcathtagtag ttgtttgtt tgtttttgag actgagtctc 1440  
actttatcac ccagactggc gtgcagtggc actatcttg ctcattgcaa cctctgcctc 1500  
ccaggtcagc ctccaagta gctgggatta caccaccatg ccagctact aaaaatactt 1560  
gtatttttag tagagacggg gtttcaccat gttgaccagg ctgggtctga actcctgacc 1620  
tcaagtgatc ttccggcctc agcctccca agtgctggat tacaggcgtg agccactgag 1680  
ccagccagca ttagtaattt ttaaaaaac tttatcagta ttttaaaat gttaatgcag 1740  
gagaaaaagat atcacaaactc tatggaaaaat gacatttcca ttgaccttat tgctacttca 1800  
agctctttaa atcaccatct tccctatttc 1830

**Fig. 10B**

1 ctcccacggg ctggctggca agcggccctg gtgggtctgc gggggcaggg gcagccctcc  
61 tggtttatct ccacggcgc gatctgctcg tccgctcgg ctccagaagc tggggctcag  
121 ggtccggcga ggcaggaagc ctgaggccac agcccagagc agctgagtg cagtcagtg  
181 ggggcgactg ctctgtggc cccgtgtgt ggggttcagc ctgtctggcg gcacccagac  
241 cccagcgtc tacgacgaga gcgggagcac cggagggtgt gatgacagca cgccctcaat  
301 cctgccctgcc cccgcgggt acccaggcca agtctgtgcc aatgacagt acacccctgga  
361 gctcccgga agctacggg cactgtctt ggcctgggtg cccaccaggc tggtgcccg  
421 ctctatagg ctggtcttgg tgggtgggt gccggccaat gggctggcg tgtgggtgct  
481 ggcacgcag gcacctcggc tgcctccac catgtgtct atgaacctcg cgactgtga  
541 ctctctgtg gccctggcg tgcctcccg gatcgctac cactgtgtg gccagcgctg  
601 gcccttcgg gaggcgcct gccgctggc cagggccga ctctatgtc acatgtatg  
661 ctcatgtct ctgtggcg cgtcagcct gcatcgctac ctggccctgg tgcacccgct  
721 gcggggccgc gccctgcgtg gccggcgct ggccttga ctctgcatgg ctgttggct  
781 catggcgcc gccctggcac tgccttgac actgcagcg cagacctcc ggcgtggcg  
841 ctccgatcg gtgtctgcc atgacgcgt gccctggac gcacaggcct ccactggca  
901 accggcctc acctgccctg cgtgttggg ctgttctcg cccctgtgg ccatgtgtct  
961 gtgtacggg gccacctgc acacgtggc ggcagcggc cggcgctac gccacgcgt  
1021 gaggtgacc gcagtgtgtc tggcctcgc cgtggccttc ttctgtcca gcaacctgt  
1081 gctgtgtctg cattactcg accgagccc cagcgccctg ggcaacctct atgtgtccta  
1141 cgtgccagc ctggcgctga gcacctcaa cagtgcgtg gatccctca tctactacta

**Fig. 11A**

1201 cgtgtcggcc gagttcaggg acaagggtcg ggcagggctc ttccaacggt cgccg9999ga  
1261 caccgtggcc tcaaggcct ctgcggaagg ggcagccgg ggcatgggca ccactcctc  
1321 ttgtctccag tgacacaaag tggggaaggc tgtactgggt cgaacagggt cccttcccc  
1381 acttcacgtc ctctctggga cctcagaatg tgacctatt tggaaatagg gttgttaca  
1441 ctgtcactag cggagggtcac ttgggagaag ggtgggcctt acatccagtg tgggtggtgt  
1501 cctcataaga taaggagagg ccaggccctg tggctcacgc ctgtaatccc agcacitaa  
1561 gaggccaagg cggatggatc acttgagccc aggagtcaa caccagccg agcaacatgg  
1621 taaacccca tctctacca aaatacaaaa attagctgg cttgggtggt ggcgcctgta  
1681 atccagcta ctcaggagac tgaggcagaa ggtatgcctg aacctgggag gcagagggtg  
1741 cagtgagccg agattgcgc actggactcc agccgtcgtg acagagagcc tgtctctaaa  
1801 ttaattaatt aattaatita attcaattt aaaaagacga aaagtgcagg ccagggtgcag  
1861 tggctcacgc ctataatctc agcactctg agcactctg gaggccaaga tggaggattg cttgaagcca  
1921 ggagttggg accagccctg gcaacatagg gggatcccat ctctacacac aaaaaaattt  
1981 ttaatgaac caggcattgt ggatgcgcc tatagtcca gccactcaag aggcacaggc  
2041 gggaggatca ctgagccctg ggaggttctg ttgcagtgta gctatgattg taccactgca  
2101 ctccagccctg ggcaacacag caagaccctg tctcaaaaat aaacaaacta aaattaaaa  
2161 aagaagacga gagatagtgg gtgtgggtgg tcacaccctg aatcccagca ctttgggaagg  
2221 ccgagggtgg cagatcatct gaggccagga gttcaagacc agccctggcta acatggtgaa

**Fig. 11B**



2281 atcctatctc taccaaaat acaaaaatta gccaggcgtg gtggtgggca ccigtactgg  
2341 ggagggtccc accagctac tggggaggct gagtcaggag aatcgcttga acctggggagg  
2401 cggagggttc ggtcagctga gatggtgcca ctgcactcca gccctgggcga aagagcgact  
2461 ctgtctccaa aaaaaagaga agaggagagg acacagagac acacagagaa gaaagccaatg  
2521 tggcggcaga ggcagagatg ggagtgaigc ggacggacac aaactaaggg atgccacgat  
2581 gccaaagaca gccaaacagc accagcagcc aggagacagg ccctgggacgg gctctccctc  
2641 acagcctcca gagggaaaca gccctgccac caccctgacc ctggacttct ggcctgcaga  
2701 actgtgagac aataaactct cattgttta agctgccctgg catgtggcac ttgtcaggg  
2761 cagcccagga atctgaaca ggaatcaaat ctgcttcttg ggcccigcca gcatctctgg  
2821 ctcggtcttc tgggctggat gcagcccacg acgcactggt gtcigagatg gggctggagc  
2881 tggggctggg gctgcattcc ctggagactc actgcaagtt cctgcccagg aggcctgaggg  
2941 caccatcc tcatgtccca atgctgtggc ccaccaggc ccagagccctg gttggccatt  
3001 ctcatgcca ccagctcttg gctttgggat gtctcttgag caaccagaat agcaccacca  
3061 actctgtctc ccaaaaccca tcatagcac ggctcagcct cctgctatcc cctgactgct  
3121 ggggaccctc gccctccctc ctctcaccctg caggctgac ctctcttca cttctgtca  
3181 atgtcaccag ggataagggt ggacaatggg ggggtgggggt ggacagtgtg tgcctgggggg  
3241 ttcggtgtct gcagaccctg aactcccttc tgcaggatg ttggcagccg gttgtaagcc  
3301 ttgcacggga cagaccacac ccacggcaac ctcatccct cagcactaac cacatccact

**Fig. 11C**

3361 ctcaaccccg tccctctgc actgaccaca ccaccccggt tcggccccgc cccccgcact  
3421 gaacactccc gccctcaacc ccgacccctc cgcactcacc tccccctcgc cgctcgaccc  
3481 cgccctcacc acactgacca cctcaacc attcgccca gtccccacca cagtgaccac  
3541 accctcactg gctcgggccct gcccccagta tactgaccat tcccagcca ctcccttc  
3601 gcactacca ctccccagc cagccccctc ccgctgacc gctctccag ccccgccctc  
3661 cccgtacagg cagagcgccc gccacctct atgctgcgtt ctctgactt tacgttgccc  
3721 cctcctctgc caagcccca gggagccct cctggcgctc cgagggtggg agtcgggggtg  
3781 tggcaggccg cgggtggggg cggcagtggc tccgcgcact caccggggcc cggggcaggg  
3841 gcgcgctcca ctctgttga cgcgggtccg gcgcacagtt ccggggcgag tgggctgtgc  
3901 gtgctgacgt tgtagaagcg agtggcctcg aaggctacgg gacgaggggtg gcgggtgacc  
3961 aagtgcaggc gcgacgggtc agggaccggg ccgggcccgg ggtgcgggcg cgcgggccta  
4021 ccgggttcgt agtagtcgta cacggagact ggacgcgccc acgtctctgcc caccacgcac  
4081 tcccgagag caccgaaccg caccacgctc aggcaccggc tggggatctg tggggcagcg  
4141 gcgggcgag gctcgacccg ggccaggagg ccgggggccc tgagctcagg ccagaactg  
4201 gctgattca gggataccca ggacgcgtga aacacagaag aaacgtgac ccatcttctt  
4261 tttttctttt actttcttt tttttttt ttctgagac agagtctcgc gctgttgccc  
4321 aggcctggagt gcagtggcgt gatctggct cactgcaagc tcggcctcct gggttcaaat  
4381 gattctctg cctcagccct ccaagtagct gggataacag gcgcccacca ccgcacccctg

**Fig. 11D**

4441 ctaattttt gtattttga tcaagacgga gttcaccat gttggccagg ctggtctcca  
4501 actcttgccc tcaagtgatc cgctcggtc ccattttta ttcttgggt ccttccatcc  
4561 cactgggaaa acgtctcagg tggcctcga aacaccactc ctttttgtgt gtgtgcacgc  
4621 atggctgagc atgtgtgggt gggagtcagc acattcacga tactgtgcaa tcatcacctc  
4681 tgtctagtta caggacgggt tctttctccc ccaaagaaac cccatcgcca tcagcactca  
4741 ctccccactc cccagcccc tggcaaccac aaatctttcc aactctacgg atttgccctgt  
4801 tctgggcatt tcatgtcaat ggaatcatgt actctgigaa aaaaaaaaaa aaaaaaaaaa  
4861 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaa

**Fig. 11E**

MWGRLLWPLVLGFSLSGGTQTTPSVYDESGTGGGDDSTPSILP  
APRGYPGQVCANDSDTLELPDSSRALLGWVPTRLPALYGLVLVGLPANGALWVL  
ATQAPRLPSTMLLMNLTADLLLALPPRIAYHLRGQRWPFGEAACRLATAALYGHM  
YGSVLLAAVSLDRYLALVHPLRARALRGRRLALGLCMAAWLMAAALALPLTLQRQTF  
RLARSDRVLC HDALPLDAQASHWQPAFTCLALLGCFLPLLAMLLCYGATLHTLAASGR  
RYGHALRLTAVVLASAVAFFVPSNLLLLLHYSDPPSAWGNLYGAYVPSLALSTLNSC  
VDPFIYYVSAEFRDKVRAGLFQRSPGDTVASKASAEGSRGMGTHSSLLQ

**Fig. 11F**